and freedomists, pantheists and atheists, scholastics and empiricists at the same time, and that to affirm the one exclusively is to expel a minority of faculties of the infinitely complex thing we call soul, and that one who truly knows himself can be any one of these only by a working majority of his powers? Accepting our cue from Aristotle, who called metaphysics those studies that come chronologically or developmentally after physics, and applying them also to all logic and epistemology, should we not recognize that the present glowing twilight of psychology is that of the dawn and not of the evening; that ultimates are chiefly for senescence and should be only prelusive for youth; that they better befit old than new sciences; and realize that if psychology is ever to become the queen of humanistic studies she must avoid all surds and extravasations and deal effectively with the great problems of human life, health, reproduction, disease and vital experience, and find the center of her field where psychic life is most intense, and thus, widening her boundaries from physiological psychology to biological philosophy, strive to become what, as we have just heard in the able address of his son, Emerson, for whom this admirable building was named, thought it should be, viz., a true natural history of the soul. Some of us deprecate this identification or organic unity of speculative philosophy with scientific psychology, and hope that, despite their proximity, neither will interfere with the purity of the other, and that progress may be made in evicting the many metaphysical, logical and epistemological and other utterly insoluble, though fascinating, questions from the domain of scientific psychology.

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SCIENTIFIC BOOKS.

Organography of Plants, especially of the Archegoniatae and Spermophyta. By Dr. K. GOEBEL, Professor in the University of Munich. Authorized English translation by ISAAC BAYLEY BALFOUR, M.A., M.D., F.R.S., King's Botanist in Scotland, Professor of Botany in the University and Regius Keeper of the Royal Botanic Garden of Edinburgh. Part II., Special Organography, with 417 wood cuts. Oxford, the Clarendon Press. 1905. Pp. xxiv + 707. Large 8vo.

It is five years since the English edition of Part I. appeared. That volume was devoted to 'General Organography,' including the general differentiation of the plant-body, relationships of symmetry, differences in the formation of organs at different developmental stages, juvenile forms, malformations and their significance in organography, and the influence of correlation and external formative stimuli upon the configuration of plants. It has proved its value by its wide use in advanced botanical teaching in this country and England. Part II. has now appeared as a bulky volume and, although the German edition from which this was translated was completed in 1901, the preface informs us that 'Professor Goebel has read all the proof-sheets, and has modified the text in several places, and added additional notes.' The volume is thus brought down to the present, and consequently is the most recent work on plant morphology, as it is the most important. The subject is taken up systematically, about one hundred and fifty pages being given to the liverworts and mosses, fifty pages to the gametophyte of the Pteridophyta, and over four hundred to the sporophyte of the Pteridophyta and Spermophyta. It is under the latter that we find the fullest discussion of the morphology of the higher plants, the matter being treated under such topics as—the organs of vegetation, including root and shoot (leaf, branching of the shoot, division of labor, the shoot in the service of reproduction), and the organs of propagation, including the sporogonium of Pteridophyta apospory, and the sporangium of Spermophyta.

It is interesting to note here the greatly broadened use of terms, which an older morphology concerned itself with narrowing. What would the botanists of the last genera-

tion have thought of the common use of 'spore' and 'sporangium' in the description of the structure of the flowering plants, and how they would have denounced the use of 'flower' and 'placenta' in the similar description of the ferns and their allies! Surely the old boundaries between lower and higher plants are rapidly being obliterated when we find such a free borrowing of terms once thought to be peculiar to this or that portion of the vegetable kingdom. Here is the present-day definition of a flower—'a shoot beset with sporophylls,' originated many years ago by Schleiden, but generally rejected by botanists until within a comparatively short time. In this broad definition we may include the spore-bearing cones, not only of *Lycopodinae* and *Equisetinae,* but also the whole fern (sporophyte) when it is bearing spores. On page 472 we have a chapter heading 'The Sporophylls and Flower of the Pteridophyta'—which would have puzzled and no doubt shocked the old-time botanists, and quite as puzzling would have been the section (page 400) devoted to 'the cotyledons of the Pteridophyta.'

In this fine volume, which must at once come into very general use, we have another illustration of the excellent translations made by Professor Balfour, and the high quality of the printing and binding done by the Clarendon Press, in the remarkable series of volumes which have appeared during the past twenty years.

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Outlines of Inorganic Chemistry. By Frank Austin Gooch, Professor of Chemistry in Yale University, and Claude Frederic Walker, Teacher of Chemistry in the High School of Commerce of New York City. New York, The Macmillan Co. Pp. xxiv + 233 + 514. 8vo. $1.75.

Until some few years ago the teacher of general chemistry considered that he had covered his subject pretty fully if, in addition to the descriptive facts concerning the elements and compounds, he had given his students correct ideas concerning the laws of chemical combination, molecular and atomic weights, the periodic law and the theory of valence. The development of physical chemistry, however, in the last fifteen years has brought into prominence a number of new laws and principles and it is necessary that these should find a place in every modern course of instruction in chemistry. This has given rise to a demand for new text-books in which these new generalizations are clearly set forth.

One of the first text-books which gave prominence to the laws of physical chemistry was Ostwald's 'Grundlinien der Anorganischen Chemie' which was published in 1900. This book may be said to have been a veritable mine of information for teachers and it has undoubtedly had a great influence in modernizing courses of instruction in inorganic chemistry. Ostwald's book, however, is too advanced and contains too much detail for the average undergraduate. A number of smaller text-books have appeared in which the attempt was made to simplify the subject and adapt it for college classes.

This new text-book by Professors Gooch and Walker is entirely different from these books that were patterned more or less closely upon the lines of the Ostwald. It is divided into two distinct parts. In the first or inductive part there is a consecutive experimental development of the principles and theories of the science. In the second or descriptive part the facts concerning the elements and compounds are clearly and concisely set forth.

The first seven chapters of part one deal with chemical change, elements, compounds, the laws of combination and equivalent weights, hydrogen, oxygen, air and nitrogen. Then electrical equivalents and ions, acids, bases and salts form the subject matter of the eighth and ninth chapters. Then follow equilibrium, mass action, the phase rule. The last chapters are upon heat and thermal equivalents, valence and atomic and molecular theories. It is here shown that the chemical, electrical and thermal equivalents represent proportionate numbers of mass units or atoms and atomic and molecular weights are defined.

In the second or descriptive part, after a chapter on classification and the periodic law,